ABSTRACT OF THE DISCLOSURE

A polymer is prepared by self-assembly of a plurality of monomeric polypeptide units. The polymer tends to form a nanotube and is capable of encapsulating a particular drug molecule. Once encapsulated in the polymer of the present invention, the drug molecule may be delivered to a particular location of human body to effectively cure a disease or treat a symptom.

Generally, the monomeric polypeptide unit of the present invention has a sequence found in *Pyrodictium abyssi*, a microorganism that produces an extracellular network having hollow protein tubes, or a sequence substantially identical thereto. The monomeric polypeptide may be mass produced using recombinant biotechnologies and be polymerized into the polymer of the present invention. One or more additional targeting vector may be attached to the monomeric polypeptide unit or the polymer to facilitate the targeting of the drug molecule that may be held there within. The sequence contained in the monomeric polypeptide unit may be further optimized using one or more technique selected from Gene Site Saturation Mutagenesis and GeneReasembly^{TM}.